REMARKS

Claims 1 to 9 and 11 to 16 continue to be in the case.

Claim 10 is being canceled.

New claims 17 to 20 are being introduced.

New claim 17 is based on the language of claim 14.

New claim 18 is based on the language of claim 15.

New claim 19 is based on the language of claim 16.

New claim 20 is based on the language of claim 1.

The Office Action refers to the Drawings.

The drawings stand objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the alarm (claims 6-7), analog interface (claims 7-8), removable diagnosis module (claim 10) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: Labels 10, 12, 13 and 18.

Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR **1.121 (b)** are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet

submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR **1.121 (d).** If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance

A "Replacement Sheet" and a "New Sheet" of drawing are attached to this amendment. The "Replacement Sheet" contains an amended Fig. 1. The "New sheet" contains a new Figure 2. An alarm signal has been added in the amended Figure 1 and the reference numerals 10, 12, 13, and 18 have been removed from Figure 1. Amended Sheet 1 addresses the Examiner's first and fourth objection to the drawing.

The new Figure 2 is derived from Figure 1, except that the interfaces are analog instead of digital. The application as filed disclosed the use of digital and/or analog interfaces. The introduction of Figure 2 addresses the Examiner's second objection to the drawings.

The cancellation of claim 10 addresses the Examiner's third objection to the drawing.

The Office Action refers to the Specification.

The abstract of the disclosure is objected to. A clean copy of the abstract on its own page should be submitted to the office. Correction is required. See MPEP § 608.01 (b).

A revised "ABSTRACT OF THE DISCLOSURE" is attached to the present amendment.

Further, the specification contains no reference to the related PCT case which should be made on the first line of the specification.

A reference relating tom the associated PCT-Application has been inserted into the specification.

The Office Action refers to Claim Objections.

Claims 1 objected to because of the following informalities:

With respect to claim 1, the phrasing of this claim has rendered it unclear and confusing. In particular the phrase "adapted in use to one or more of the number of fieldbuses by means of...". The examiner is instead relying on claim 13 to interpret this claim since it is much clearer from that one what the applicant intends. However, assuming such clarification, the examiner cannot distinguish between these two claims.

Claim 1 was amended to obviate the objection.

In claims 7 and 8, the phrase "in use" should most likely be removed wherever it appears. This phrase does not appear to add any limitation or meaning to the claim.

The objected standing phrase has been stricken in claim 7 and was amended in claim 8.

Claim 15 is somewhat unclear. First, commas should be added between the words "which" and "on" in the first line and between "fieldbuses" and "a" in the second line. Second, the claim might be clearer if each "in which a..." clause were replaced with "wherein a" and if these clauses were separated and indented. Third, line 6 of the claim should read "which a third common mode signal..."

Claim 15 has been amended to remove the objections.

Claims 7-8 and 9 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Each of these claims references an "alarm" which is not in the parent claim. These claims therefore lack proper antecedent basis.

Appropriate correction is required.

Claims 7, 8, and 9 have been amended to provide proper antecedent basis.

The Office Action refers to Claim Rejections - 35 USC § 102.

1.

Claims 1-2 and 7-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Scecina (US pat 5511223).

With respect to claim 1 and 13, Scecina discloses an apparatus comprising:

1) A modular fieldbus board (Fig 1) comprising a number of fieldbuses (Fig 1 item 40 is the module, Fig 5 item 18 shows the fieldbus board itself) connected to a bulk power supply (column 3 lines 64-67).

2) A diagnostic system (Fig 1 item 50 and Fig 4) comprising a monitoring transceiver means connected to one or more of the number of fieldbuses (Fig 4 items 12-15) by means of two or more common mode and/or differential mode signal injection and/or signal detection points, which points are dispersed between the bulk power supply and the fieldbus trunk, such that the monitoring transceiver means can detect one or more fieldbus physical layer characteristics between two of the two or more of said points (Figs 4 and 5).

Claims 1 and 13 have been amended to overcome the rejections.

The amended claim 1 contains three key limitations over original Claim 1. The amended claim 13 contains two additional limitations in addition to those acted upon in the last office Action. Firstly, the monitoring transceiver means is connected to two or more fieldbuses, as opposed to just one or more. This feature is supported by the embodiment, in which the monitoring transceiver means is connected to fieldbuses 8a to 8n. Secondly, each connection to a fieldbus comprises points which collectively inject and/or detect both common mode and differential mode signals, as opposed to common mode and/or differential mode signals. Again, this feature is supported by the embodiment, in which the connections to the fieldbuses comprise common mode points 2,4, and 6, and differential mode point 7. Thirdly, a feature from original Claim 7 has been introduced into claim 1, namely that the monitoring transceiver means has an interface with an associated device. The Claim 1 as amended also states that this interface is "separate from the fieldbus trunk" and transmits its data "directly" to the associated device.
In addition to these changes, Claim 1 has also been reworded in a number of ways, either to accommodate the above changes, or to make it clearer. In particular, the word "adapted" in the third line was inappropriate, and has been replaced with the word "connected" (the word "connected" was used correctly in the original Claim 13). Further, the points are now "located" between the power supply and the trunk, as opposed to "dispersed" between them.

The amended Claim 1 is novel and inventive over US 5511223 SCECINA et al. because in that case there is no use of common mode and differential mode signals to monitor for fieldbus physical layer characteristics on two or more circuits. In SCECINA et al. a single circuit is switched to a test status and test logic signals are sent to a logic circuit to test its response, or the voltage is measured on either side of trips in a trip string. These diagnostic features bare no resemblance at all to the invention of the Claim 1 as amended.

With respect to claim 2, Scecina discloses the fieldbus physical layer characteristics comprise one or more of: over/under termination, noise/ripple level, signal level, signal bias, signal jitter, signal ringing, signal distortion, signal attenuation, cross talk, unbalance, and earth leakage (column 4 lines 21-50).

Applicants have looked at the Scecina et al. reference, column 4, lines 21 to 50, but do not find any language relating to fieldbus layer characteristics.

With respect to claim 7, Scecina discloses that the monitoring transceiver means is provided with a first digital and/or an analogue interface, such that diagnostic data detected and/or alarms created by the monitoring transceiver means in use are transmitted to a digital or analogue device operated by a user, and such that commands are sent in use from the user operated digital or analogue device to operate the monitoring transceiver means (Fig 1 item 60 and claim 2).

Claim 2 of the reference Scecina et al. is only concerned with digital modules, but not with analog modules.

With respect to claim 8, Scecina discloses a second digital and/or an analogue interface, such that diagnostic data detected and/or alarms created by the monitoring transceiver means in

use are transmitted to other associated diagnostic systems (Fig 1 item 60 this workstation is another system associated).

Applicants do not see in Scecina et al., Figure 1, any analog interface. The element 82 of Figure 1 is specially marked as "data bus". According to the Scecina et al. reference, column 4, line 4, item 60 in Figure 1 is an equipment rack.

With respect to claim 9, Scecina discloses a visual means to display diagnostic data (Fig 1 item 60 and claim 2). "Provided with" is not limited to "integral to".

According to the Scecina et al. reference, column 4, line 4, item 60 in Figure 1 is an equipment rack and not a visual means to display diagnostic data. According to claim 2 of the Scecina et al. reference, information concerning a module is displayed and not a visual mean s to display diagnostic data.

With respect to claim 10, Scecina discloses that the diagnosis module is removable from the fieldbus board (Abstract).

The Scecina et al. reference does not refer to a diagnostic module. All modules can be plugged into the rack. A test rack is connected to the module for applying test signals. A test rack is not a fieldbus board.

With respect to claim 11, Scecina discloses that the monitoring transceiver means is connected to the bulk power supply (column 3 lines 64-67).

The reference Scecina et al. states in column 3, lines 61 to 63 that 'The module 40 is typically situated in a module rack alongside other modules.". There is nothing about a monitoring transceiver means connected to a bulk power supply. "connections to power and process signals" are not a substitute for a bulk power supply.

With respect to claim 12, Scecina discloses signal detection points are disposed within hardware carried on the board (Fig 5).

A module 40 is seen in Figure 5, but there are no signal detection points shown or suggested in Figure 5 of the reference Scecina et al.

The Office Action refers to Claim Rejections - 35 USC § 103.

2.

Claims 1-13 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Eryurek (US pat 6859755) in view of DelaCruz (US pat pub 20040073402).

The rejection is respectfully traversed.

With respect to claim 1 and 13, Eryurek discloses an apparatus comprising:

1) A modular fieldbus board (Fig 1 item 18) comprising a number of fieldbuses (Fig 1 items 20 and Fig 2 each of which is a fieldbus unit in loop 18) connected to a bulk power supply (Fig 2 item 30).

2) A diagnostic system (Fig 2 item 36) comprising a monitoring transceiver means connected to one of the number of fieldbuses (Fig 2) by means of two or more common mode and/or differential mode signal injection and/or signal detection points, which points are dispersed between the bulk power supply and the fieldbus trunk (Fig 2).

Claim 1 has been amended to patentably define over the reference Erylurek et al.

The amended Claim 1 is novel and inventive over US 2002/0169582 ERYUREK because in that case there is no use of common mode signals, as there is no reference ground point The diagnostic circuitry is housed in a field device, so it cannot be connected to a reference point, and as a result it only uses

differential mode diagnostic signals. As a result of this the device in ERYUREK can measure for noise, signals levels, device current, plot changes and so on, but It has no capacity to measure for cable unbalance, current drawn by the trunk cable or a device coupler, or zero crossing errors. Further, the device In ERYUKREK only works with the device to which it is fitted, not all the devices on the fieldbus trunk, and in addition it only relates to one single fieldbus, not two or more, as in the present invention. The device in ERYUREK also transmits its findings over the fieldbus trunk along with the normal signal data, which slows the system down. This is different to the present invention In which the diagnostic data is transmitted directly to an associated device separately from the fieldbus trunk.

With respect to claim 2, Eryurek discloses the fieldbus physical layer characteristic comprises, at least noise/ripple level (column 3 line 66).

The reference Eryurek et al. teaches in column 3, line 66 "the quiescent noise level on the loop;", but no fieldbus physical layer is suggested.

With respect to claim 3, Eryurek discloses that the monitoring transceiver means also detects one or more characteristics of hardware carried on the modular fieldbus board by means of one or more of said points (column 4 lines 35-38).

The reference Eryunek et al. teaches in column 4, lines 35 to 38: "Finally, diagnostic circuitry 36 can also provide quiescent current and voltage rail monitoring of the device electronics of field device 20 in order to indicate the continued health, or otherwise, of the electronics within field device 20.".

Applicants urge that there are no signal injecting and signal detecting points in the teaching of the Eryurek et al. reference.

With respect to claim 4, Eryurek discloses that the one or more characteristics of hardware comprise one or more of: voltage, short circuit, hardware module failure, quiescent current, and rate of charge (column 4 lines 35-38).

The reference Eryurek et al., column 4, lines 35 to 38 was reproduced above. Nothing was said there about diagnosing voltage, short circuit, hardware module failure, quiescent current, and rate of charge.

With respect to claim 5, Eryurek discloses that the monitoring transceiver means is adapted to gather received data and produce one or more of: Fourier analysis, trending analysis, and data logging, (column 4 lines 10-21).

The reference Eryurek et al. in column 4, lines 10 to 21 does not refer to any Fourier analysis or any data logging.

With respect to claim 6, Eryurek discloses that the monitoring transceiver means is adapted to provide an alarm in the event that received data indicates one or more of pre-determined failures or the one or more fieldbuses (column 4 lines 14-16 and 19-21).

Nothing is found in the reference Eryurek et al. on an alarm or of a predetermined failure.

With respect to claim 7, Eryurek discloses that the monitoring transceiver means is provided with a first digital and/or an analogue interface, such that diagnostic data detected and/or alarms created by the monitoring transceiver means in use are transmitted to a digital or analogue device operated by a user, and such that commands are sent in use from the user operated digital or analogue device to operate the monitoring transceiver means (column 4 19-21).

The reference Eryurek et al. does not teach any analog interface. The reference further fails to teach that diagnostic data detected and/or alarms created by the monitoring transceiver are transmitted to a digital or analog device.

With respect to claim 8, Eryurek discloses a second digital and/or an analogue interface, such that diagnostic data detected and/or alarms created by the monitoring transceiver means in use are transmitted to other associated diagnostic systems (Fig 1 item 14).

The reference Eryirek et al fails to teach an analog interface. The reference Eryurek in column 2, line 57: "Controller 12 is coupled to I/O and control subsystem 14 ..." does not refer to the alleged diagnostic system.

With respect to claim 9, Eryurek discloses a visual means to display diagnostic data (Fig 1 item 12 and column 4 19-21).

The reference Eryurek et al. in column 4, lines 19 to 21 fails to suggest any visual display means.

With respect to claim 11, Eryurek discloses that the monitoring transceiver means is connected to the bulk power supply (Fig 2 item 30).

While Figure 2 of the reference Eryurek shows "DIAGNOSTIC CIRCUITRY", this is not necessarily a monitoring transceiver as required in claim 11.

With respect to claim 12, Eryurek discloses signal detection points are disposed within hardware carried on the board (Fig 2).

The reference Eryurek et al. fails to teach or to suggest any signal detection points with respect to Fig. 2.

With respect to claim 1 and 13, Eryurek fails to specify fieldbus physical layer characteristics between two of the two or more of said points.

With respect to claim 10, Eryurek fails to disclose the monitoring transceiver means is removable from the fieldbus board.

The present amendment cancels claim 10.

DelaCruz teaches, with respect to claims 1 and 13:

2) A diagnostic system (Fig 1 item 22) comprising a monitoring transceiver means connected to one or more of the number of fieldbuses (Fig 1) by means of two or more common mode and/or differential mode signal injection and/or signal detection points, which points are dispersed between the bulk power supply and the fieldbus trunk, such that the monitoring transceiver means can detect one or more fieldbus physical layer characteristics between two of the two or more of said points (paragraph 0012).

DelaCruz teaches, with respect to claim 10, that the monitoring transceiver means is removable from the fieldbus board (Fig 1 item 22).

It would have been obvious to one of ordinary skill in the art to modify the apparatus of Eryurek by using a separate handheld diagnostics device as taught by DelaCruz. Eryurek discloses that the monitored quality may be signal noise, which, being a subspecies of "fieldbus layer characteristics" clearly is in the same field of endeavor as DelaCruz. Further, the portable device of DelaCruz reduces cost be eliminating redundant components (i.e. using the same testing circuitry for all modules).

Applicants respectfully disagree. The references Eryurek et al. and DelaCruz et al clearly fail to teach or to suggest the combination proposed in the Office Action.

The device shown In US 2004/0073402 DELACRUZ uses the same diagnostics arrangement as that shown in ERYUREK, except that the diagnostic circuitry is housed in a portable unit. However, it also does not use common mode diagnostics signals as there is no ground reference point, and it is only capable of working with one circuit, not two or more.

3.

Claims 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eryurek and DelaCruz as applied to claim 13 above, and further in view of Westerfeld (WO 009945621).

With respect to claims 14-16, Eryurek and DelaCruz fail to disclose a power supply converter and conditioner. One of ordinary skill in the art would have found it obvious to put power conditioning and/or conversion onboard such a module to eliminate noise and, especially in the intrinsically safe environment of Eryurek, to prevent sparks or explosions. However, the examiner presents the following reference to show further this obviousness.

Westerfeld teaches, with respect to claim 14, power supply conversion (Fig 2 item 114) and power supply conditioning (Fig 2 item 1131-113n) in an intrinsically safe fieldbus (abstract) environment (Fig 1 item 1).

Applicants respectfully disagree. The English language abstract of the Westerfield reference refers to item 1131 – 113n as "current limiting means" and to item 114 as voltage limiting means. A voltage limiting means 114 is generally no power supply converter and a current limiting means 1131 – 113n is generally no power supply conditioner in contrast to the allegation in the Office Action.

It would have been obvious to one of ordinary skill in the art, as stated above to modify the apparatus of Eryurek and DelaCruz by including power conversion and conditioning. Both Eryurek and Westerfeld present the importance for intrinsic safety of such conversion to prevent an accident due to sparking or other power-related issues.

Applicants respectfully urge that there is no suggestion within the four corners of the references Eryurek et al, DelaCruz et al. and Westerfield to perform the combination proposed in the Office Action.

With respect to claims 15-16, the examiner has given these claims the broadest reasonable interpretation. The examiner maintains that these claims may be interpreted as "common mode signal detection points" being merely points within the system capable of being monitored with an injected or detected signal. The examiner maintains that, under this interpretation, since reference Westerfeld discloses such components connected to each other, these points do exist though they are not being actively monitored.

The references recited fail to teach the signal injection and/or signal detection points, which are adapted to inject and/or detect both common mode and differential mode signals.

Reconsideration of all outstanding rejections is respectfully requested.

All claims as presently submitted are deemed to be in form for allowance and an early notice of allowance is earnestly solicited.

Respectfully submitted,

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